REMARKS

This response is intended as a full and complete response to the Office Action dated February 11, 2004. In view of the following discussion, the Applicants believe that all claims are in allowable form.

IN THE CLAIMS

Claims 1 and 8 have been amended to correct minor informalities. Specifically, the word "an" was added to the beginning of each claim to change the phrase "Apparatus" to "An apparatus."

Claim 57 has been amended to correct dependency to claim 56.

The applicants submit that the amendments were made for reasons unrelated to patentability and that no new matter was added.

CLAIM REJECTIONS

35 U.S.C. §103(a) Claims 1-4, 8-11, 13-15, and 17-21

Claims 1-4, 8-11, 13-15, and 17-21 stand rejected as being unpatentable over Japanese Patent No. 2121347 (Hereinafter *Okayama*) in view of United States Patent No. 4,706,793, issued November 17, 1987, to *Masciarelli* (hereinafter *Masciarelli*), United States Patent No. 4,621,936, issued November 17, 1986, to *Hansson et al.* (hereinafter *Hansson*), United States Patent No. 4,801,144, issued January 31, 1989, to *De Masi, Jr. et al.* (hereinafter *De Masi*), United States Patent No. 4,108,455, issued August 22, 1978, to *James* (hereinafter *James*), United States Patent No. 5,520,473, issued May 28, 1996, to *Durham* (hereinafter *Durham*), Japanese Patent Publication No. 08017753 (Hereinafter *Tokyo Electron*), and Japanese Patent Publication No. JP411130249A (Hereinafter *Suzuki*). The Applicants respectfully disagree.

A. Claims 1-4

Claims 1-4 recite limitations not taught or suggested by any permissible combination of the cited references. *Okayama* teaches a wafer positioning device for orienting a wafer prior to conveying the wafer to the next processing step. The wafer positioning device includes a base table 1, a support board 4 coupled to the base table in a rotatable manner via a pivot 5. The support board 4 has support balls 7 that support the back side of a wafer. *Okayama* does not teach or suggest a ball that is at least one of coated or plated, as disclosed in claim 1.

Masciarelli teaches a conveyor system with rollers and plungers. The plunger may include a polished steel ball. Such a teaching makes *Masciarelli* an improper reference to base a rejection over the claimed invention. "In order to rely on a reference as a basis for rejection of an Applicants' invention, the reference must either be in the field of Applicants' endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); *MPEP* 2141.01(a). The Applicants submit that the conveyor system disclosed by *Masciarelli* is neither "in the field of Applicants' endeavor" nor "reasonably pertinent to the particular problem" solved by the present invention. General purpose conveyor systems are not in the same field of art as semiconductor support structures. Moreover, the particular problem solved by the present invention is the reduction of scratches or other damage to a substrate due to contact between the substrate and the support. The conveyor system of *Masciarelli* does not teach or suggest a support system suitable for reducing scratches or other damage to an item placed upon it. In fact, the steel balls are intended only to raise the conveyed item above the driven rollers of the conveyor system to temporarily stop its movement and are not rotatably disposed within their housings. (*Masciarelli*, Figs. 1-8 and accompanying text) As such, *Masciarelli* is not reasonably pertinent to the problem with which the Applicants were concerned and would not have logically commended itself to the inventor's attention. *See also, In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because

of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem"). Therefore, *Masciarelli* may not be relied upon as prior art with respect to the present invention.

However, even assuming arguendo that *Masciarelli* is a proper reference, neither *Okayama*, *Masciarelli*, nor any of the other cited references provide any motivation or suggestion to incorporate the polished steel ball of *Masciarelli* with the wafer positioning device of *Okayama*. The Examiner relies upon "the known substitution of equivalents" as the motivation. However, the Examiner provides no evidence or line of reasoning how or why the steel balls of *Masciarelli* are equivalent to the support balls of *Okayama* or why it would be desirable to modify the balls of *Okayama* with a feature of the conveyor balls of *Masciarelli*. The Applicants request the Examiner specifically state what features make these structures known equivalents. Therefore, the references are not permissibly combinable.

Hansson teaches a zirconia ball for use in a ball point pen. *Hansson* discloses a ball finish roughness range to make them suitable for use in rolling ball pens, (*Hansson*, col. 3, ll. 40-42), and viscous ink pens, (*Hansson*, col. 3, ll. 43-44). *Hansson* is an improper reference to base a rejection over the claimed invention for the same reasons as discussed above. The zirconia ball disclosed by *Hansson* is neither "in the field of Applicants' endeavor" nor "reasonably pertinent to the particular problem" solved by the present invention. Rolling pen balls are not in the same field of art as semiconductor support structures. In addition, the zirconia ball of *Hansson* does not teach or suggest a support system suitable for reducing scratches or other damage to an item placed upon it. Moreover, even the surface finishes suggested by *Hansson* is only provided to teach a suitable value for use in a rolling ball or viscous ink pen. As such, *Hansson* is not reasonably pertinent to the problem with which the Applicants were concerned and would not have logically commended itself to the inventor's attention. Therefore, *Hansson* may not be relied upon as prior art with respect to the present invention.

However, even assuming arguendo that *Hansson* is a proper reference, neither *Okayama*, *Hansson*, nor any of the other cited references provide any motivation or suggestion to incorporate the surface finish of the zirconia ball of *Hansson* with the wafer positioning device of *Okayama* or the conveyor ball of *Masciarelli*. The Examiner relies upon "the known substitution of equivalents" as the motivation. However, the Examiner provides no evidence or line of reasoning how or why the zirconia pen balls of *Hansson* are equivalent to the support balls of *Okayama* or the conveyor balls of *Masciarelli*. The Applicants request the Examiner specifically state what features make these structures known equivalents. Moreover, there is no reason why it would be desirable to modify a support ball of *Okayama* or a conveyor ball of *Masciarelli* with the features of a ball of a pen. Therefore, the references are not permissibly combinable.

De Masi teaches a street hockey puck having balls contained in a puck-like enclosure. The balls may be coated with an anti-friction coating. (*De Masi*, Fig. 1; col. 2, ll. 67-68). *De Masi* is an improper reference to base a rejection over the claimed invention for the same reasons as discussed above. The street hockey puck disclosed by *De Masi* is neither "in the field of Applicants' endeavor" nor "reasonably pertinent to the particular problem" solved by the present invention. Hockey pucks are not in the same field of art as semiconductor support structures. In addition, *De Masi* does not teach or suggest a support system suitable for reducing scratches or other damage to an item placed upon it. As such, *De Masi* is not reasonably pertinent to the problem with which the Applicants were concerned and would not have logically commended itself to the inventor's attention. Therefore, *De Masi* may not be relied upon as prior art with respect to the present invention.

However, even assuming arguendo that *De Masi* is a proper reference, neither *Okayama*, *De Masi*, nor any of the other cited references provide any motivation or suggestion to incorporate the anti-friction coated balls of *De Masi* with the wafer positioning device of *Okayama*, the conveyor ball of *Masciarelli* or the pen ball of *Hansson*. The Examiner relies upon "the known substitution of equivalents" as the motivation. However, the Examiner provides no evidence or line of reasoning how or why the hock y puck balls of *De Masi* are equivalent to the support balls of *Okayama*.

The Applicants request the Examiner specifically state what features make these structures known equivalents. Moreover, there is no reason why it would be desirable to modify a support ball of *Okayama*, a conveyor ball of *Masciarelli*, or a pen ball of *Hansson* with features of a street hockey puck. Therefore, the references are not permissibly combinable.

James teaches a cargo pallet incorporating retractable ball units. The balls may be formed from or coated with an elastomer such as PTFE. (*James*, col. 5, ll. 12-13). *James* is an improper reference to base a rejection over the claimed invention for the same reasons as discussed above. The cargo pallet and elastomer coated ball disclosed by *James* is neither "in the field of Applicants' endeavor" nor "reasonably pertinent to the particular problem" solved by the present invention. Cargo pallets are not in the same field of art as semiconductor support structures. In addition, *James* does not teach or suggest a support system suitable for reducing scratches or other damage to an item placed upon it. As such, *James* is not reasonably pertinent to the problem with which the Applicants were concerned and would not have logically commended itself to the inventor's attention. Therefore, *James* may not be relied upon as prior art with respect to the present invention.

However, even assuming arguendo that *James* is a proper reference, neither *Okayama*, *James*, nor any of the other cited references provide any motivation or suggestion to incorporate the elastomer coated cargo pallet balls of *James* with the wafer positioning device of *Okayama*. The Examiner relies upon "the known substitution of equivalents" as the motivation. However, the Examiner provides no evidence or line of reasoning how or why the cargo pallet balls of *James* are equivalent to the support balls of *Okayama*. The Applicants request the Examiner specifically state what features make these structures known equivalents. Moreover, there is no reason why it would be desirable to modify a support ball of *Okayama*, a conveyor ball of *Masciarelli*, a pen ball of *Hansson*, or a street hockey puck of *De Masi* with the features of cargo pallet balls. Therefore, the references are not permissibly combinable.

Durham teaches a ball point pen. *Durham* is an improper reference to base a rejection over the claimed invention for the same reasons as discussed above. The ball point pen disclosed by *Durham* is neither "in the field of Applicants' endeavor" nor "reasonably pertinent to the particular problem" solved by the present invention. Ball point pens are not in the same field of art as semiconductor support structures. In addition, *Durham* does not teach or suggest a support system suitable for reducing scratches or other damage to an item placed upon it. In fact, the ball point pen, or even the seat upon which the ball sits, is not intended to support anything. It merely serves to withstand the force applied when writing and allow for the free flow of ink. As such, *Durham* is not reasonably pertinent to the problem with which the Applicants were concerned and would not have logically commended itself to the inventor's attention. Therefore, *Durham* may not be relied upon as prior art with respect to the present invention.

However, even assuming arguendo that *Durham* is a proper reference, neither *Okayama*, *Durham*, nor any of the other cited references provide any motivation or suggestion to incorporate the ball point pen ball seat of *Durham* with the wafer positioning device of *Okayama*. The Examiner relies upon "the known substitution of equivalents" as the motivation. However, the Examiner provides no evidence or line of reasoning how or why the ball point pen ball seat of *Durham* is equivalent to the support balls of *Okayama*. The Applicants request the Examiner specifically state what features make these structures known equivalents. Moreover, there is no reason why it would be desirable to modify a support ball of *Okayama*, a conveyor ball of *Masciarelli*, a pen ball of *Hansson*, a street hockey puck of *De Masi*, or a cargo pallet ball of *James* with the features of a ball seat of a pen. Therefore, the references are not permissibly combinable.

Tokyo Electron discloses a chamber body. However, *Tokyo Electron* teaches away from the use of a rotatable ball to support the wafer. *Tokyo Electron* teaches a single crystal of Si to form the ball-shaped support member which is non-rotationally embedded in the support parts of the vertical struts. Furthermore, *Tokyo Electron* teaches that a preferred embodiment of the inv ntion is a pillar or other flat-topped

shape as shown in drawings 6 and 7. Thus, *Tokyo Electron* teaches that a flat-topped support is preferred over a rounded support. Therefore, *Tokyo Electron* teaches away from a ball rotatably disposed on a ball support surface, the ball adapted to contact and support a substrate thereon, as recited in claim 1.

Suzuki discloses a substrate carrying device having support rollers for carrying a large substrate. However, *Suzuki* does not teach or suggest a ball that is at least one of coated or plated, as claimed in claim 1. Nor is there any suggestion or motivation in the cited art to modify the rollers of *Suzuki* with the support ball of *Okayama*, the conveyor balls of *Masciarelli*, the pen balls of *Hansson*, the hockey puck balls of *De Masi*, the cargo pallet balls of *James* or the ball point pen seat of *Durham*.

Therefore, as *Masciarelli*, *Hansson*, *De Masi*, *James*, and *Durham* are not proper prior art references with respect to the present invention, and furthermore, as there is no motivation to combine the above references or any of the remaining references in any manner which yields the claimed invention, a *prima facie* case of obviousness has not been established. Thus, the Applicants submit that independent claim 1 and all claims depending therefrom are patentable over *Okayama* in view of *Masciarelli*, *Hansson*, *De Masi*, *James*, *Durham*, *Tokyo Electron*, and *Suzuki*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

B. Claims 8-11, 13-21, 52 and 55

Claims 8-11, 13-21, 52 and 55 recite limitations not taught or suggested the cited references, alone or in combination. *Okayama* is discussed above. *Okayama* does not disclose a chamber body having at least one substrate access port or at least one support member coupled to an interior portion of the chamber body as recited in claim 8. *Masciarelli*, *Hansson*, *De Masi*, *James*, and *Durham* are inapplicable references for the reasons discussed above (and are furthermore non-combinable for lack of motivation). However, even assuming *arguendo* that *Masciarelli*, *Hansson*, *De Masi*, *James*, and *Durham* are applicable, none of the references disclose a chamber body having at least one substrate access port or at least one support member coupled to an interior portion of the chamber body as recit d in claim 8.

Tokyo Electron discloses a chamber body. However, *Tokyo Electron* teaches away from the use of a rotatable ball to support the wafer. As discussed above, *Tokyo Electron* teaches a single crystal of Si to form the ball-shaped support member which is non-rotationally embedded in the support parts of the vertical struts. Furthermore, *Tokyo Electron* teaches that a preferred embodiment of the invention is a pillar or other flat-topped shape as shown in drawings 6 and 7. Thus, *Tokyo Electron* teaches that a flat-topped support is preferred over a rounded support. Therefore, *Tokyo Electron* teaches away from a ball disposed on a support member, the ball rotatably adapted to support a glass substrate as recited in claim 8.

Suzuki discloses a wafer carrying device including rollers for moving a substrate through a processing system. *Suzuki* does not disclose a chamber body, at least one support member coupled to an interior portion of the chamber body, and one or more balls disposed on the support member and rotatably adapted to support the substrate, as recited in claim 8. As discussed above, *Tokyo Electron* teaches away from using rotatable support structures in the support struts of the disclosed chamber. Therefore, the combination of *Okayama*, *Masciarelli*, *Hansson*, *De Masi*, *James*, *Durham*, *Tokyo Electron*, and *Suzuki* fails to teach or suggest a chamber body, at least one support member coupled to an interior portion of the chamber body, and one or more balls disposed on the support member and rotatably adapted to support the substrate, as recited in claim 8. As such, a *prima facie* case of obviousness has not been established because no permissible combination of references teaches or suggests all of the limitations of claim 8, and any claims depending therefrom.

Thus, the Applicants submit that independent claim 8 and all claims depending therefrom are patentable over *Okayama* in view of *Masciarelli*, *Hansson*, *De Masi*, *James*, *Durham*, *Tokyo Electron*, and *Suzuki*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

C. Claims 47-51

Claims 47-51 recite limitations not taught or suggested the cited references, alone or in combination. *Okayama* is discussed above. *Okayama* does not teach or suggest a ball that has a surface roughness of 4 micro-inches or smoother, as recited in claim 47. *Masciarelli*, *Hansson*, *De Masi*, *James*, and *Durham* are inapplicable references for the reasons discussed above (and are furthermore non-combinable for lack of motivation). Even assuming arguendo that *Masciarelli*, *Hansson*, *De Masi*, *James* and *Durham* are applicable, only *Hansson* discloses a surface roughness value. However, as discussed above, the surface finishes referred to in *Hansson* only teach a suitable value for transferring ink in a pen. As such, there is no motivation to incorporate *Hansson* with any of the other cited references in the manner suggested by the Examiner.

Tokyo Electron discloses a chamber body. However, *Tokyo Electron* teaches away from the use of a rotatable ball to support the wafer. As discussed above, *Tokyo Electron* teaches a single crystal of Si to form the ball-shaped support member which is embedded in the support parts of the vertical struts. Furthermore, *Tokyo Electron* teaches that a preferred embodiment of the invention is a pillar or other flat-topped shape as shown in drawings 6 and 7. Thus, *Tokyo Electron* teaches that a flat-topped support is preferred over a rounded support. Therefore, *Tokyo Electron* teaches away from a ball disposed on a support member, the ball rotatably adapted to support a glass substrate as recited in claim 8.

Suzuki discloses a substrate carrying device having support rollers for carrying a large substrate. However, *Suzuki* does not teach or suggest a ball that has a surface roughness of 4 micro-inches or smoother, as recited in claim 47. As such, the incorporation of *Suzuki* with any of the cited reference will still fail to yield all of the limitations recited in claims 47-51.

Therefore, the combination of *Okayama*, *Masciarelli*, *Hansson*, *De Masi*, *Jam s*, *Durham*, *Tokyo Electron*, and *Suzuki* does not teach or suggest a body having a first portion and a second portion, the first portion adapted to interface with the support member; a socket disposed in the second portion and having a ball support surface; and a ball rotatably disposed on the ball support surface in the socket, wherein the ball has a surface roughness of 4 micro-inches or smoother, the ball adapted to contact and support a substrate thereon, as recited in claim 47. As such, a *prima facie* case of obviousness has not been established because there is no motivation to combine the references as suggested by the Examiner and, furthermore, because the combinable references fail to disclose all of the limitations recited in claim 47, and any claims depending therefrom.

Thus, the Applicants submit that independent claim 47 and all claims depending therefrom are patentable over *Okayama* in view of *Masciarelli*, *Hansson*, *De Masi*, *James*, *Durham*, *Tokyo Electron*, and *Suzuki*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

NEW CLAIM

New claim 59 has been added. The Applicant believes that claim 59 is fully supported by the specification and that no new matter has been entered. Claim 59 recites limitations patentable over the art of record. Specifically, claim 59 depends from claim 8 and recites additional limitations therefor. Thus, the Applicants respectfully request allowance of new claim 59.

CONCLUSION

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

If, however, the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Mr. Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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4-21-04
Date of signature